



TO STUDY AND COMPARE THE EFFECTIVENESS OF THE STATIC AND PNF STRETCHING ON THE HAMSTRING TIGHTNESS

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ABSTRACT

Objective: 1) To study and compare the effectiveness of Static and PNF stretching on the Hamstring Tightness

Methods: A total number of 30 subjects with hamstring tightness were selected by purposive sampling method, after considering the inclusion and exclusion criteria and are randomly allocated into two groups with age group between 25-35 years. Range of Motion (ROM) of hip joint flexion was taken as parameters. Pre-test data was collected for Group A and Group B were computed. Group A subject were treated with Static stretching exercise for period of 30 days and Group B subject were treated with Proprioceptive Neuromuscular Facilitation stretching exercise for period of 30 days. At the end of 30 days post test ROM of hip flexion was recorded and analyzed.

Result: In the analysis and interpretation of range of motion of hip joint flexion for the effects of static and PNF stretching, the paired calculated T-value of Group B is much more greater than Group A at various level, which shows that there was statistically significant difference between pre versus post result of the two groups. The mean difference of Group B is in ROM is 30.9 and 4.7 respectively which in comparison to other group is much greater, hence showed that there was significant improvement in Hamstring Tightness in response to PNF stretching

Conclusion: The study shows that PNF stretching is much more effective than Static stretching in case of Hamstring tightness.

KEY WORDS: ROM, static, PNF.

INTRODUCTION:

Hamstring is the posterior femoral muscle consists mainly of three muscles

- Semitendinosus
- Semimembranosus
- Biceps femoris

Hamstring tightness, often defined as a lack of ROM with a concomitant feeling of restriction in the posterior thigh, has been documented across all age groups as a potential cause of dysfunctional or restricted movement of the hip. Hamstring tightness is usually seen in the sport person like rugby, football, cricket, soccer player etc, but can commonly be seen in normal individual who resist normal workout or exercise. Stretching technique commonly reduce the hamstring tightness[1].

Muscular flexibility is an important aspect of normal human function. Limited flexibility has been shown to predispose a person to several musculoskeletal over-use injuries and significantly affect a person's level of function [2, 3, 4, 5, 6]. Muscular tightness is frequently postulated as an intrinsic risk factor for the development of a muscle injury. Musculotendinous strains are among the most prevalent, as well as the most frustrating, groups of injuries for athletes and health care professionals.

Stretching exercises have traditionally been included as part of a training and recovery program. Evidence shows that physical performance in terms of maximal strength, number of repetitions and total volume are all affected differently by the each form of stretching – static stretch (SS), dynamic stretch (DS) and Pre-contraction stretching, Proprioceptive Neuromuscular Facilitation stretching (PNFS) being the most common type[2,3].

Stretching can help improve flexibility and range of motion about your joints. Improved flexibility may: Improve your performance in physical activities; Decrease your risk of injuries; Help your joints move through their full range of motion; Enable your muscles to work most effectively[4]

Static stretching (SS) is a type of stretching exercises in which elongation of muscle with application of low force and long duration (usually 30 sec). Static stretching has a relaxation, elongation effect on muscle, improving range of motion (ROM), decreasing musculotendinous stiffness and also reduces the risk of acute muscle strain injuries.[5] It is a slow controlled movement with emphasis on postural awareness and body alignment. It is suitable for all patient types.[6]

Multiple PNF stretching techniques exist, all of them rely on stretching a muscle

to its limit. This triggers the inverse myotatic reflex, a protective reflex that calms the muscle to prevent injury. Regardless of technique, PNF stretching can be used on most muscles in the body. PNFS can also be modified so you can do them alone or with a partner.[8]

The types of PNF stretch techniques are listed below,

- Contract Relax (CR) Contraction of the muscle through its spiral-diagonal PNF pattern, followed by stretch.
- Hold Relax (HR) Contraction of the muscle through the rotational component of the PNF pattern, followed by stretch.

Contract-Relax Agonist Contract (CRAC) Contraction of the muscle through its spiral-diagonal PNF pattern, followed by contraction of opposite muscle to stretch target muscle.

METHODOLOGY:

This study was carried out in Dynamic Health Home, Janakpurdham, and Bara Nursing Home, Kalaiya, Bara. Age of participants was ranges from 25 to 35 years. There was two group, each group has 15 subjects.

Research design:

Age group: 25 to 35 years.

Sample collection: Random sampling

Selection criteria:

Inclusion criteria:

Age: 25 to 35 years

Sex: No sex bar, both male and female subjects were included.

Bilateral or unilateral hamstring tightness

Pain doing flexion movement of hip joint.

Exclusion criteria :

Degenerative lumbar or disc diseases in the mature athletes

Femoral Neck Fracture.

Eliopsoas tendinitis

Lumbosacral Disc Injury

Lumbosacral Spine sprain/ strain injury

Lumbosacral Spondylolisthesis

Osteitis Pubis

Piriformis syndrome

Sacroiliac joint Injury

Snapping Hip syndrome

Protocol:

30 males and females with age 25 to 35 years as per inclusion criteria where included. Written consent was taken from volunteer and procedure was explain to them in details. The subject for the study were chosen randomly and were assigned to two group.

Procedure:

Group A was treated with Static stretching and Group B was treated with PNF technique. There ROM was recorded for the first day. Treatment was continued for the 30 days for the respective groups and again their ROM was measured and noted.

Observation and result

The data was presented using descriptive statistics such as mean, standard deviation(SD) followed by multiple bar charts. Further comparison between Group A and Group B was done using independent sample t- test. The recorded value were expressed as mean \pm SD. The level of significance was set at 5%. All p- value less than 0.05 were considered to be significant.

RESULT:

An analysis of the available data of 30 patient, the demographic parameters were comparable in all the two groups without any statistically significant difference.

A student t-test was used to compare the performance of subjects of Group A and Group B on static and PNF prior to the intervention program.

The analysis of Pre intervention score of Group A, ROM is [\bar{x} =74.1, SD=2.87], Group B, ROM is [\bar{x} =76.4, SD=3.18].

The comparison of post intervention score of Group A ROM is [\bar{x} =78.5, SD=2.66], Group B ROM is [\bar{x} =87.8, SD=2.49]

This reveals the significant difference with a T value of PNF stretching in Group B is 11.26 ± 2.34 with a P-value >0.05 . Thus indicating that Group B had marked improvement after the analysis of Static and PNF stretching in subject of Hamstring tightness.³

Table 1.1: Mean and Standard Deviation of age for the subject of two groups

Demographic Data	Group A	Group B
	Mean \pm Std. Deviation	Mean \pm Std. Deviation
Age	26 \pm 2.90	28.26 \pm 3.53

Table 1.2: Comparison of ROM between the means of Groups at the first and the last day

Variables	Range of Motions	
	ROM Pre	ROM Post
Group A	74.1 \pm 2.87	78.5 \pm 2.65
Group B	76.4 \pm 3.18	87.7 \pm 2.49

Table 1.3: Comparison of ROM between the groups at the first and last day

Dependent Variable	Between pre & post intervention	Mean Difference	Standard Error	tcal Value
ROM Group A	0-30 Days	4.6	0.53	8.67
ROM Group B	0-30 Days	11.28	0.6	18.76

DISCUSSION:

The design of the study was experimental. The purpose of the study was to see the effects of combined Static and PNF stretching on Hamstring Tightness. For testing the Hypothesis, we use two Group, Group A with only Static Stretching and Group B with only PNF Stretching.

T-test was done between two groups and mean difference of variables were calculated between Group A versus Group B and the results shows that there are better result in group B thus the present study prove the experimental hypothesis

and suggest that PNF stretching is effective as compared to Static stretching.

CONCLUSION:

Based on these results , this study concluded that the PNF stretching in comparison to the Static stretching is much more effective in improvement of Hamstring tightness when given for specific period of time

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